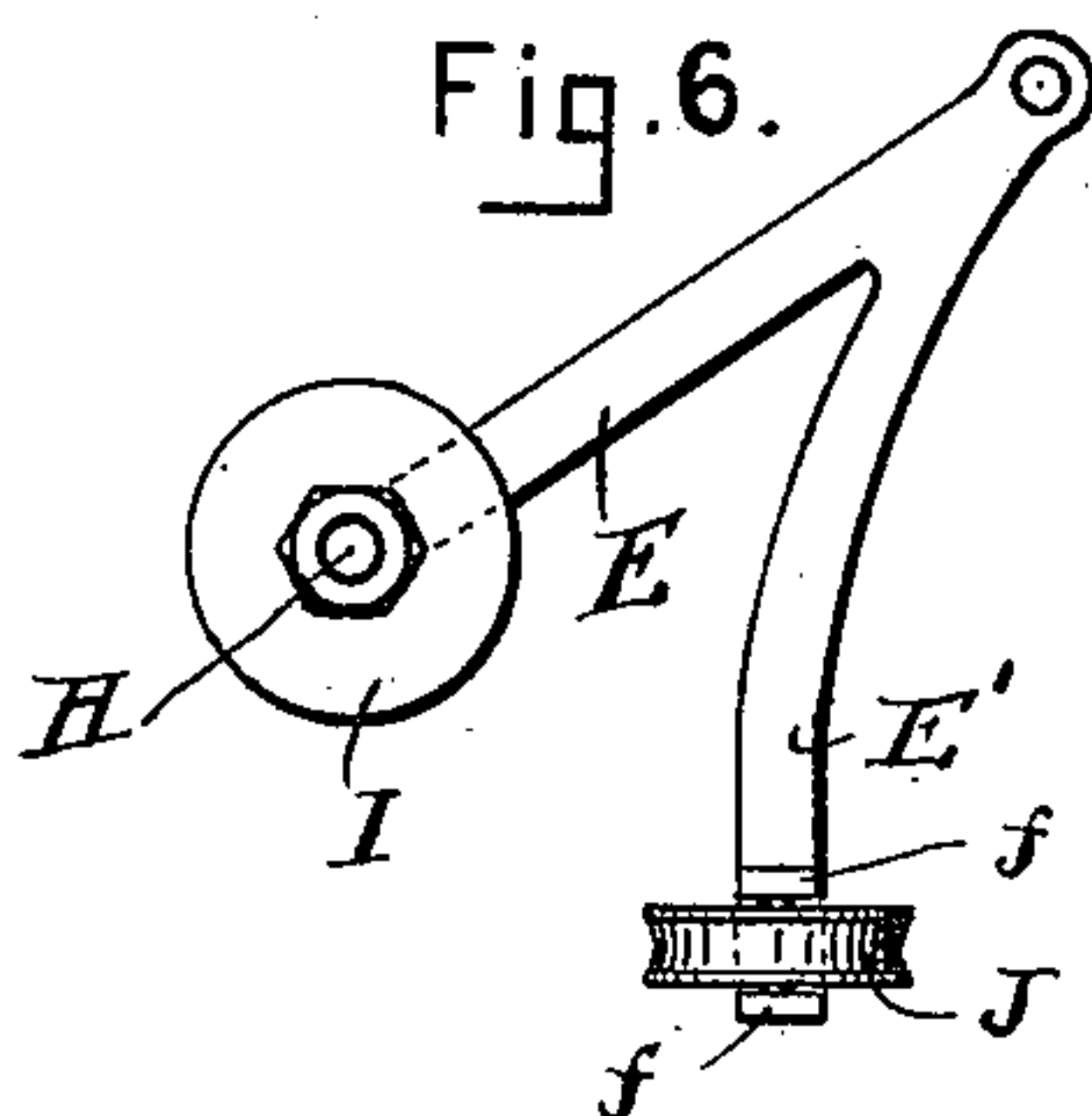
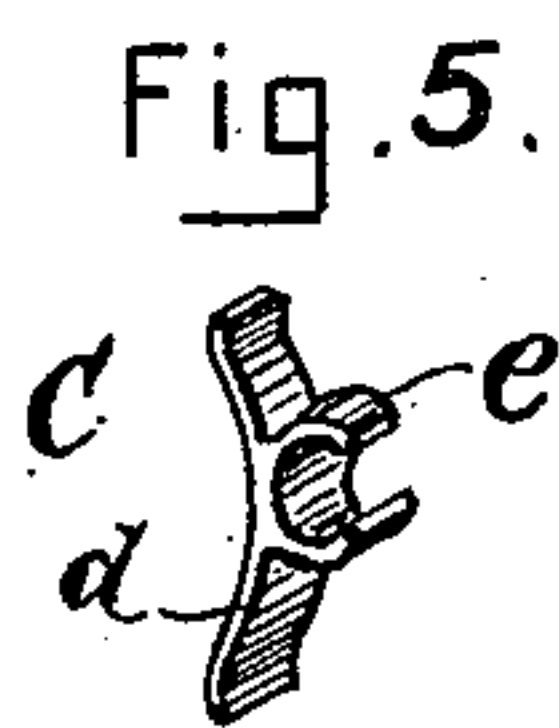
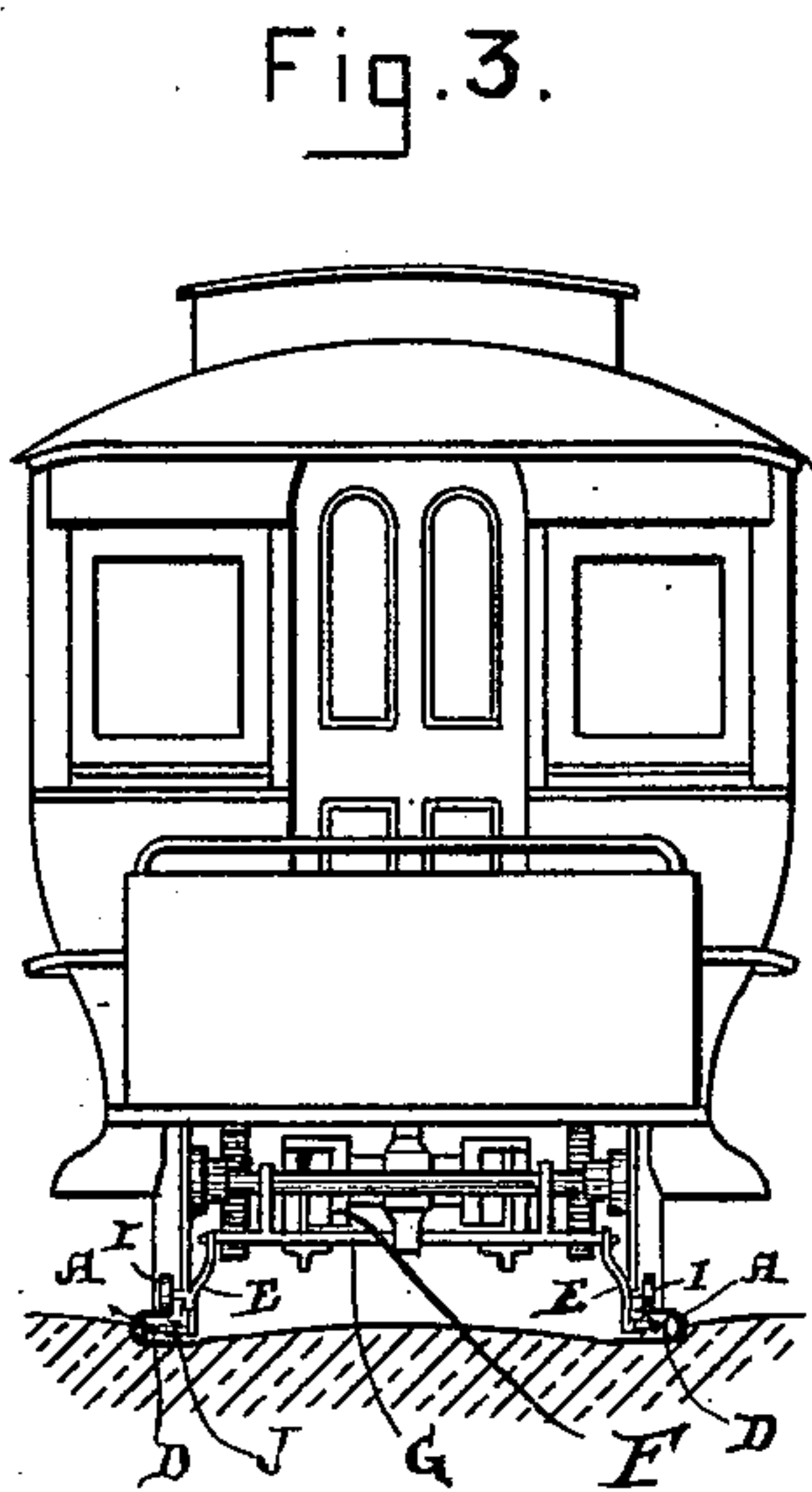
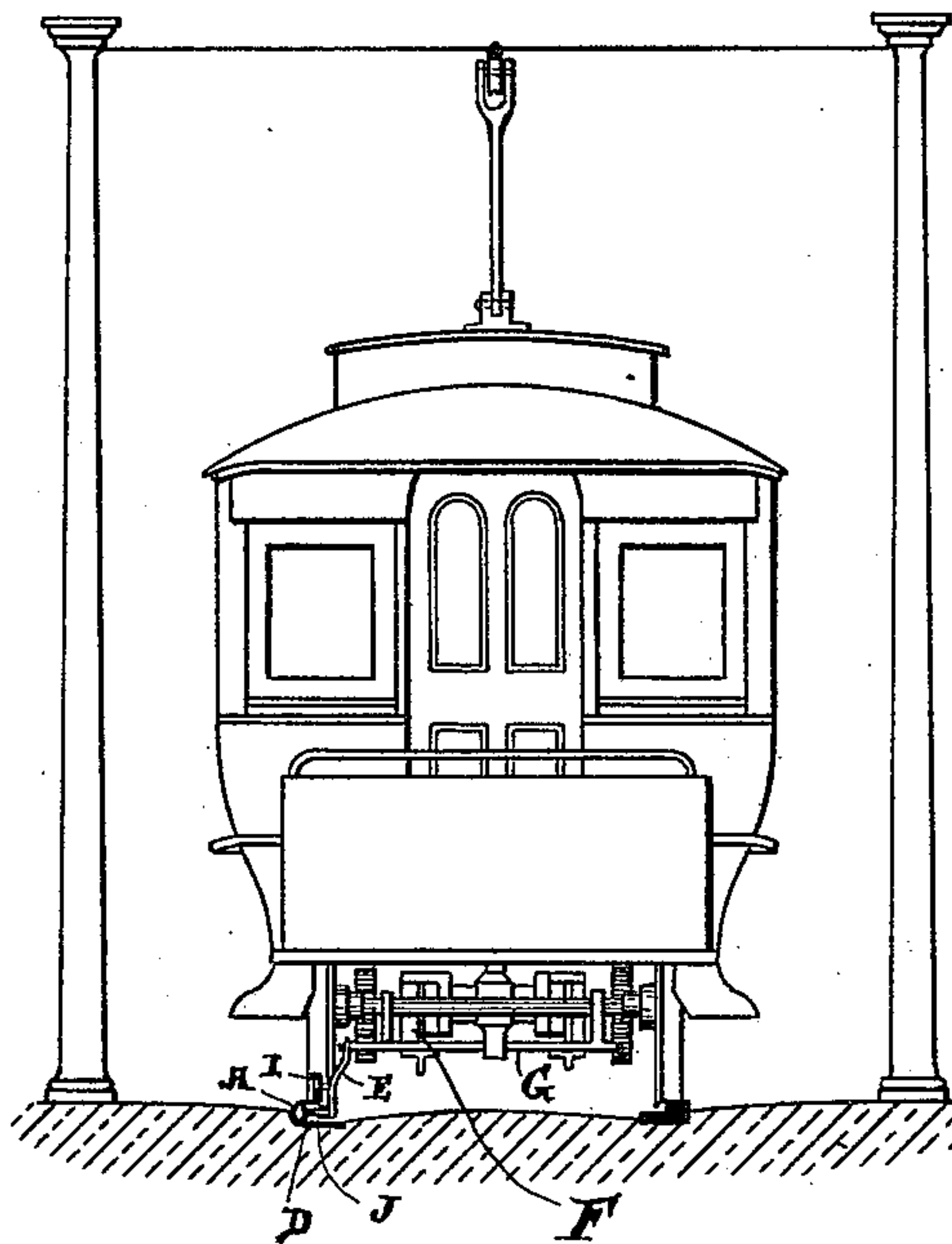
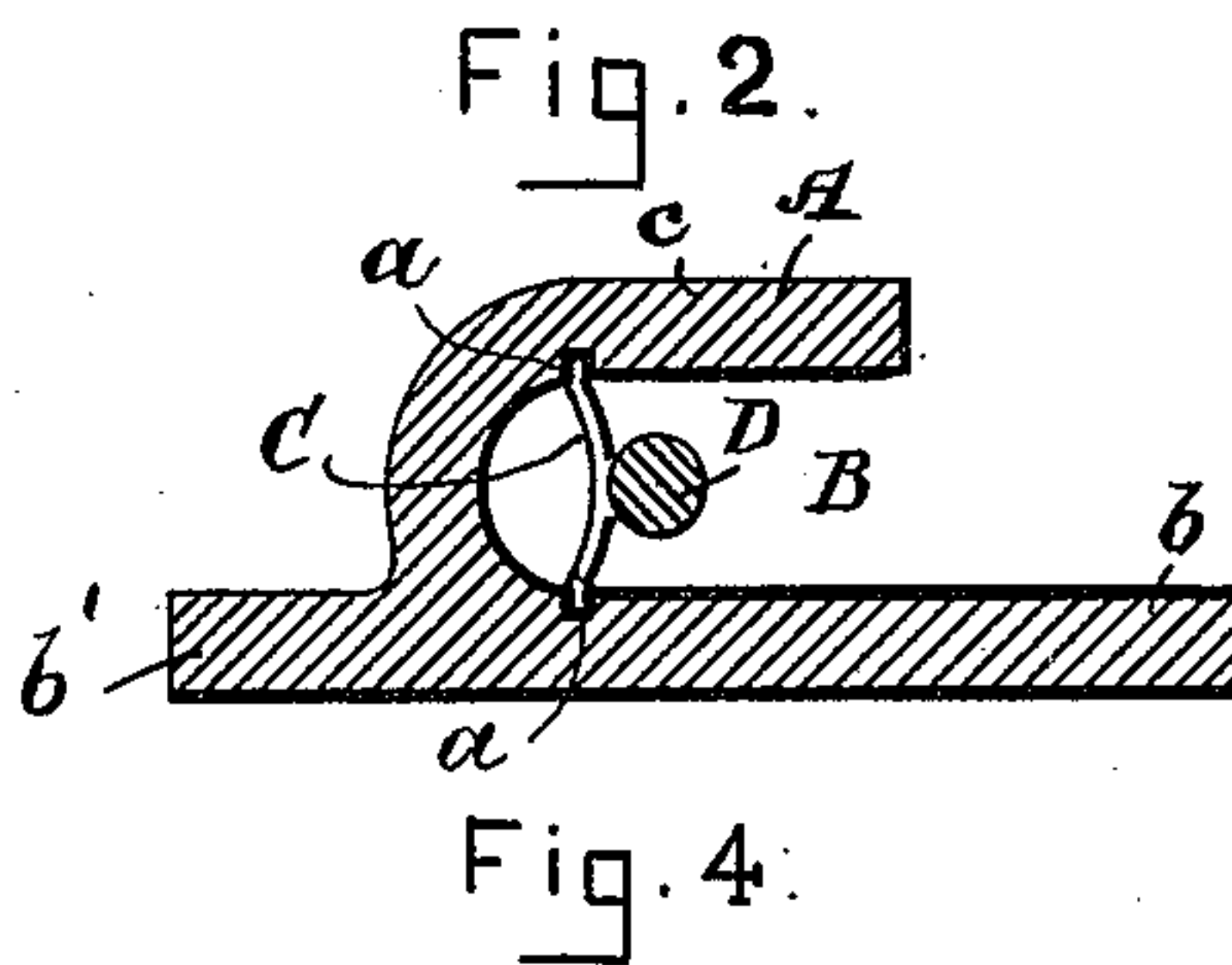
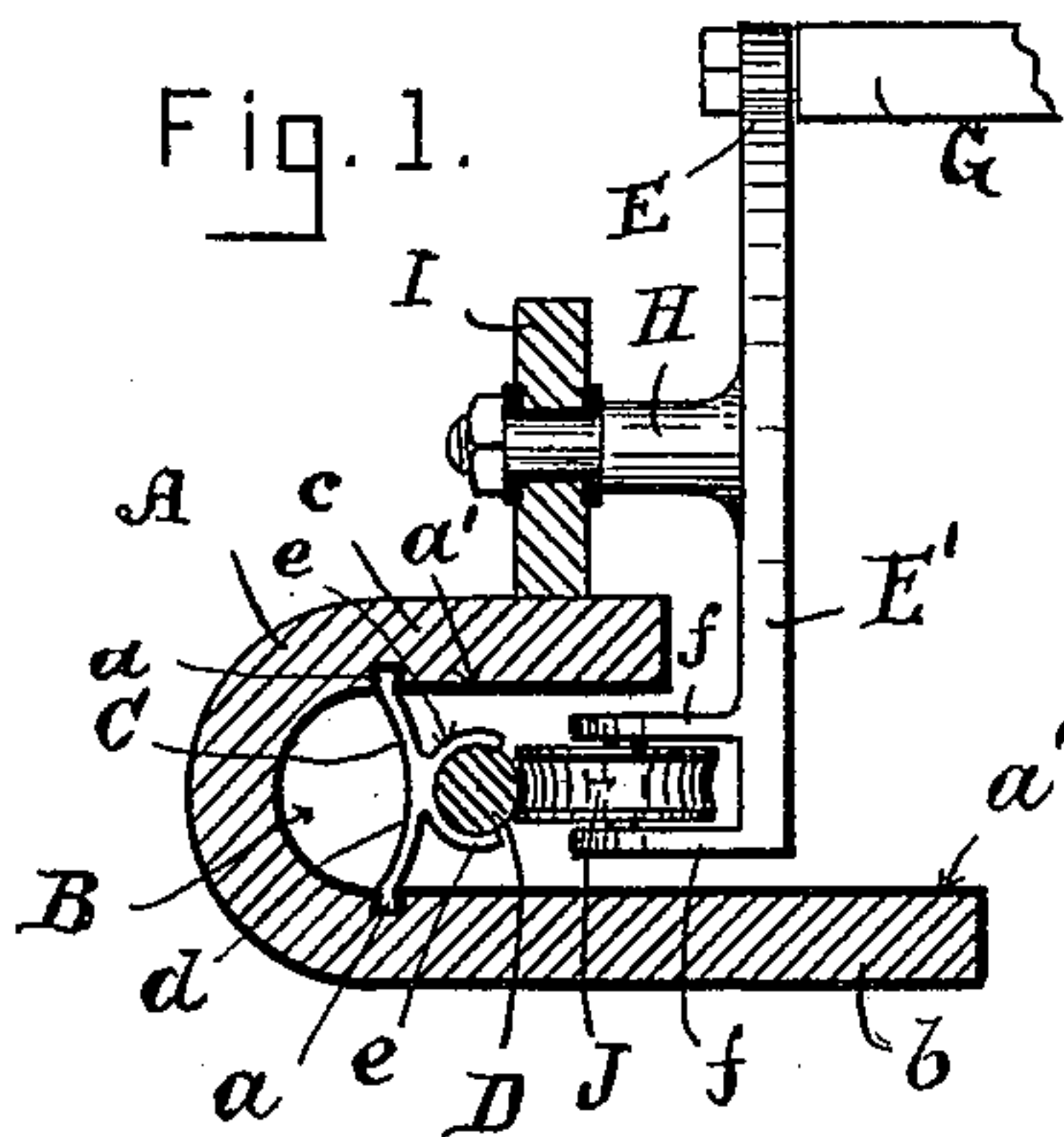


(No Model.)

H. W. LIBBEY.  
ELECTRIC RAILWAY.

No. 441,572.

Patented Nov. 25, 1890.



Witnesses.

*John H. Wood*  
*William H. Cook*

Inventor.

*Hosea W. Libbey*  
by *Edwin Blanta*  
Attorney.



# UNITED STATES PATENT OFFICE.

HOSEA W. LIBBEY, OF BOSTON, MASSACHUSETTS.

## ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 441,572, dated November 25, 1890.

Application filed October 9, 1889. Serial No. 326,373. (No model.)

*To all whom it may concern:*

Be it known that I, HOSEA W. LIBBEY, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Electric Railways, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to the means for carrying electric conductors on electric railways so as to obtain perfect safety; and the invention consists in forming the rails of the track hollow, insulating the inner surface of the same, and suspending the electric conductor therein, and also in the construction of the conductor for making contact with the motor on the car, as hereinafter fully described, and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 represents a cross-section of a rail and conductor and a contact to the car embodying my invention. Fig. 2 shows a modification of the rail and means for supporting the conductor. Fig. 3 is a cross-section through a track with both rails embodying my invention, showing the car and contacts between it and the main electric conductors. Fig. 4 is a cross-section through a track with one ordinary rail and one rail embodying my invention, showing the car in connection with an overhead conductor and the conductor in the rail. Figs. 5 and 6 are details.

A represents the rail, which is preferably of metal, which is first rolled flat with two grooves *a* extending its entire length. It is then bent to a J form, as shown, the wide portion forming the bearing-surface *b* to rest upon the sleepers, the car-wheels running upon the narrow or tread portion *c*. When thus rolled a space B is formed between the upper and lower portions, and the two grooves *a a* will be opposite each other. The entire inner surface is then coated with any suitable insulating material *a'*.

C is a spring-catch for holding the electric conductor D, (one of which is shown detached in Fig. 5,) and consists of a back piece *d* and a clasp *e*, which may be formed of one piece of metal, or of two pieces fastened together. The ends of the back piece *d* are sprung into the grooves *a a* and hold firmly. These spring-

catches are inserted in the rail at suitable intervals, and when the track is laid the conductor D, which is preferably of wire, is inserted into the clasp *e*, which supports it in the center of the opening B.

The conductor that connects between the conductor D and the motor F on the car consists of a drag-bar E, the upper end of which is secured to frame G, fastened to the axles of the car. The outer end of the drag-bar E is provided with a boss H, upon which is mounted a small wheel I, that runs upon the tread portion *c* of the rail, the wheel being of insulating material or else insulated from the stud H, as shown.

The drag-bar E is formed with a depending arm E', the lower end of which is provided with projections or ears *f*, in which is mounted a contact-wheel J, that runs upon the conductor D, thus forming a connection between the conductor D and the motor F on the car.

In Fig. 6 I have shown a side view of the conductor.

In Fig. 2 I have shown a rail with a rear extension *b'*, so that the rail can be secured on both sides, if desired, and instead of the spring-clips I have shown springs secured at proper intervals to the conductor D, the ends of springs being slipped into the grooves *a*, so that the conductor is supported as shown.

In Fig. 3 I have shown a track in which both rails are provided with conductors, one being the positive and the other the negative, and in Fig. 4 I have shown a track with an overhead conductor and one rail of ordinary construction, the other rail being provided with a conductor and constructed according to my invention.

It will be seen that by the construction of a rail and conductor as described the conductor D is some distance from the outer edge of the rail and nothing can come in contact with it unless passed into the space B, and the interior or inner surface of the rail being coated with insulating material the rail is protected and cannot become charged with electricity, thereby preventing all possibility of danger.

What I claim is—

1. A rail rolled to the form shown, so as to leave a space between the tread and bearing-



surface, and having grooves into which the ends of springs are inserted, said springs supporting an electric conductor, substantially as shown and described.

5 2. A railroad-rail consisting of lower portion *b* and tread *c*, with a space *B* between the same, and having grooves *a a*, in combination with spring-catches *C*, consisting of a back piece *d* and clasp *e*, for supporting the  
10 electric conductor *D*, substantially as shown and described.

3. The drag-bar *E*, the upper end of which is connected to a fixed point and in contact with the motor on a car and its lower end  
15 carrying a wheel *I*, insulated therefrom, said bar having an extension *E'*, the lower end of which is provided with ears *f*, in which is mounted a contact-wheel *J*, substantially as shown and described.

20 4. The combination, in an electric railway, with a rail having a longitudinal cavity open on its inner side, of an electric conductor sup-

ported within said cavity by spring-clips, substantially as and for the purposes set forth.

5. A hollow rail having grooves on its inner side opposite to each other, the inner surface of which is coated with insulating material, an electric conductor held in said hollow by spring-clips, the outer ends of which are secured in said grooves, a conductor attached  
25 to the car and consisting of a drag-bar having a wheel on its outer end which runs on the top of the rail, and a wheel running in contact with the conductor in the rail to form a connection between the conductor and the  
30 motor on the car, substantially as set forth. 35

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 28th day of August, A. D. 1889.

HOSEA W. LIBBEY.

Witnesses:

CHAS. STEERE,  
EDWIN PLANTA.